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10/043,010	01/11/2002	Stanford R. Ovshinsky	2076	6131

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ENERGY CONVERSION DEVICES, INC.  
2956 WATERVIEW DRIVE  
ROCHESTER HILLS, MI 48309

EXAMINER

ZERVIGON, RUDY

ART UNIT PAPER NUMBER

1763

DATE MAILED: 12/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/043,010

Applicant(s)

OVSHINSKY, STANFORD R.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 25-27,31-35,39 and 40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 25-27,31-35,39 and 40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “opposed planar exterior surfaces” and “” must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 25, 31, 33, and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Turlot; Emmanuel et al. (US 6,502,530 B1). Turlot teaches a gas distribution cathode (31; Figure 2; column 6, lines 18-39) for plasma enhanced deposition of semiconductor materials onto multiple webs of substrate material simultaneously comprising: (a) a cathode body (31; Figure 2; column 6, lines 18-39): said cathode body (31; Figure 2; column 6, lines 18-39) comprising a monolithic body (31; Figure 2; column 6, lines 18-39) having two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) and an edge (top, bottom; Figure 2; column 6, lines 18-39); said monolithic body (31; Figure 2; column 6, lines 18-39) having a process gas distribution system (52,54,56,58,50; Figure 2; column 5, lines 27-67) integrated entirely therein, said process gas distribution system (52,54,56,58,50; Figure 2; column 5, lines 27-67) including: i) at least one primary gas distribution channel (52+horizontal portion between 52/54; Figure 2; column 5, lines 27-67) formed into said monolithic body (31; Figure 2; column 6, lines 18-39); said primary gas distribution channel (52+horizontal portion between 52/54; Figure 2; column 5, lines 27-67) beginning at a first point on the edge (top, bottom; Figure 2; column 6, lines 18-39) of said monolithic body (31; Figure 2; column 6, lines

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18-39) and extending nearly completely through said monolithic body (31; Figure 2; column 6, lines 18-39) in a direction which is parallel to said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67); a plurality of second gas distribution channels (56+horizontal portion between 56/58; Figure 2; column 5, lines 27-67) branching off from said primary gas distribution channel (52+horizontal portion between 52/54; Figure 2; column 5, lines 27-67) and extending nearly completely to the edge (top, bottom; Figure 2; column 6, lines 18-39) of said monolithic body (31; Figure 2; column 6, lines 18-39) in a direction which is parallel to said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67); and

iii) a plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) branching off from said secondary gas distribution channels (56+horizontal portion between 56/58; Figure 2; column 5, lines 27-67) and extending to outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at one of said opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of monolithic body (31; Figure 2; column 6, lines 18-39), some of said plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at a first of said two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) and the remainder of said plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at a second of said two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) such that the gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) are evenly dispersed on both of said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column

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6, lines 18-39); and (b) a plurality of gas dispersion plates (horizontal portions above 50; Figure 2) covering said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) so as to prevent direct, line-of-sight travel of process gas from said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) to a substrate upon which semiconductor material is to be deposited, as claimed by claim 25

Turlot further teaches:

- i. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 25, wherein said monolithic body (31; Figure 2; column 6, lines 18-39), and said gas dispersion plates (horizontal portions above 50; Figure 2) are formed from a metal or metallic alloy which is noncreative with said process gases, as claimed by claim 31 – Applicant’s claim requirement of “is noncreative with said process gases” is a claim requirement of intended use in the pending apparatus claims. Said use depends on the gas identity – Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).
- ii. An apparatus for the plasma enhanced deposition of semiconductor materials onto one or more webs of substrate material, said apparatus including: a gas distribution cathode (31;

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Figure 2; column 6, lines 18-39) comprising: (a) a cathode body (31; Figure 2; column 6, lines 18-39); said cathode body (31; Figure 2; column 6, lines 18-39) comprising a monolithic body (31; Figure 2; column 6, lines 18-39) having two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) and an edge (top, bottom; Figure 2; column 6, lines 18-39); said monolithic body (31; Figure 2; column 6, lines 18-39) having a process gas distribution system (52,54,56,58,50; Figure 2; column 5, lines 27-67) integrated entirely therein. said process gas distribution system (52,54,56,58,50; Figure 2; column 5, lines 27-67) including; at least one primary gas distribution channel (52+horizontal portion between 52/54; Figure 2; column 5, lines 27-67) formed into said monolithic body (31; Figure 2; column 6, lines 18-39); said primal gas distribution channel beginning at a first point on the edge (top, bottom; Figure 2; column 6, lines 18-39) of said monolithic body (31; Figure 2; column 6, lines 18-39) and extending nearly completely through said monolithic body (31; Figure 2; column 6, lines 18-39) in a direction which is parallel to said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67); ii) a plurality of secondary gas distribution channels (56+horizontal portion between 56/58; Figure 2; column 5, lines 27-67) branching off from said primary gas distribution channel (52+horizontal portion between 52/54; Figure 2; column 5, lines 27-67) and extending nearly completely to the edge (top, bottom; Figure 2; column 6, lines 18-39) of said monolithic body (31; Figure 2; column 6, lines 18-39) in a direction which is parallel to said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67); and iii) a plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) branching

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off from said secondary gas distribution channels (56+horizontal portion between 56/58; Figure 2; column 5, lines 27-67) and extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at one of said two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of monolithic body (31; Figure 2; column 6, lines 18-39), some of said plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at a first of said two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) and the remainder of said plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at a second of said two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) such that the gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) are evenly dispersed on both of said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39); and (b) a plurality of gas dispersion plates (horizontal portions above 50; Figure 2) covering said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) so as to prevent direct, line-of-sight travel of process gas from said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) to a substrate upon which semiconductor material is to be deposited, as claimed by claim 33

- iii. The apparatus of claim 33, wherein said monolithic body (31; Figure 2; column 6, lines 18-39) and said gas dispersion plates (horizontal portions above 50; Figure 2) of said gas



distribution cathode (31; Figure 2; column 6, lines 18-39) are formed from a metal or metallic alloy which is nonreactive with said process gases, as claimed by claim 39 – Applicant’s claim requirement of “is noncreative with said process gases” is a claim requirement of intended use in the pending apparatus claims. Said use depends on the gas identity – Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 26, 27 and 34, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turlot; Emmanuel et al. (US 6,502,530 B1). Turlot is discussed above. Turlot does not teach:
  - i. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 25, wherein said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) are evenly positioned on said two opposed planar surfaces (horizontal portions of 54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39) said from 1 to 4 inches apart, as claimed by claim 26

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- ii. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 26, wherein said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) are evenly positioned on said two opposed planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39) from 2 to 3 inches apart, as claimed by claim 27
- iii. The apparatus of claim 33, wherein said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) of said gas distribution cathode (31; Figure 2; column 6, lines 18-39) are evenly positioned on said two opposed planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39) said from 1 to 4 inches apart, as claimed by claim 34
- iv. The apparatus of claim 34, wherein said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) of said gas distribution cathode (31; Figure 2; column 6, lines 18-39) are evenly positioned on said two opposed planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39) from 2 to 3 inches apart, as claimed by claim 35

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the relative locations of Turlot's gas outlets.

Motivation to optimize the relative locations of Turlot's gas outlets is to promote even depositions and thereby avoid unwanted patterning as taught by Turlot (). Further, it is well established that the rearrangement of parts is considered obvious to those of ordinary skill (In re Japikse , 181 F.2d 1019, 86 USPQ 70 (CCPA 1950); In re Kuhle , 526 F.2d 553, 188 USPQ 7

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(CCPA 1975); Ex parte Chicago Rawhide Manufacturing Co. , 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).; MPEP 2144.04)

3. Claims 32 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turlot; Emmanuel et al. (US 6,502,530 B1) and Drage; David J. (US 4,590,042 A) in view of Dhindsa; Rajinder et al (US 6,786,175 B2). Turlot and Drange are discussed above. Turlot and Drange do not teach:

- i. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 31, wherein said metal or metallic alloy which is nonreactive with said process gases is stainless steel, as claimed by claim 32

Dhindsa teaches a stainless steel cathode showerhead (310; Figure 3) for plasma operations (column 8; lines 14-33) including process gas distribution holes (354; Figure 3) with optimal spacing as taught by Dhindsa.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Drage to use stainless steel material for his Drage's dispersion plates (15; Figure 1; column 2; lines 26-68) as taught by Dhindsa.

Motivation for Drage to use stainless steel material for his Drage's dispersion plates (15; Figure 1; column 2; lines 26-68) as taught by Dhindsa is to enhance transfer heat through Drange's dispersion plates as taught by Dhindsa (column 8; lines 14-33).

#### ***Response to Arguments***

4. Applicant's arguments filed September 22, 2006 have been fully considered but they are not persuasive.

5. Applicant states:

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“

the Office has completely twisted and mischaracterized the teachings of the '530 reference in an attempt to meet the claim limitations of the present invention.

“

6. In response, In response to applicant's argument that Turlot is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Turlot is demonstrated (see above), the Turlot is both in the field of applicant's endeavor and is reasonably pertinent to the particular problem with which the applicant was concerned – gas distribution in reactors.

7. Applicant states:

“

The Office suggests that the gas distribution cathode of the '530 reference is only reference number 31 of figure 2 of the '530 reference. This is completely inaccurate. The plasma chamber of figure 2 of the '530 reference is reference number 36 and the gas distribution cathode of the '530. reference actually minimally includes components 31, 60 and 40. This is clearly not a monolithic body.

“

In response, constant cross-hatching element 31 is a “monolithic body” in Turlot's Figure 2.

Applicant states;

“

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The horizontal portions (or any other portion) of reference numerals 50, 54, 56 and 58 are not exterior, nor are they planar.

“

In response, the Examiner disagrees. Turlott's horizontal portions as opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of reference numerals 50, 54, 56 and 58 are exterior to body 31 and planar horizontally.

Applicant states:

“

The Office the goes on to say that the Internal gas distribution network (reference numbers 50, 52, 54, 56 and 58) of the '530 reference is not only both the exterior surfaces and the gas distribution network of the monolithic cathode as discussed above, but is also the gas outlet ports within the exterior surfaces of the monolithic cathode of the '530 reference.

“

In response, Applicant is again directed to the above ground of rejection whereby the claimed outlets are Turlot's vertical portions of 54,56,58; Figure 2; column 5, lines 27-67.

### ***Conclusion***

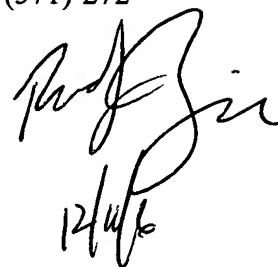
8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.



12/14/16